



# CLEANRoom

by Tervovent





# | INTRODUCTION

As a company we are devoted to creating ideal work environments with minimal expenses and to developing products that can satisfy even the most rigorous of quality

and energy efficiency standards. Through compliance with sustainable development principles, our efforts are aimed at Termovent's future evolution.

Cleanroom is an environment that has a controlled level of contamination that is specified by the number of particles per cubic meter for the appropriate particle size.

Termovent specializes in production of modular panel systems, which are used in the field of clean room technology.

The whole system is aligned with GMP and FDA directives, as well as ISO 14644 standard. Compliance with applicable regulations in the field of clean room technology enables its use in rooms from ISO 9 to ISO 1 class (GMP classes A, B, C and D).

Modular component systems are easily integrated with all other systems. By combining a variety of materials in panel production for cleanrooms, Termovent company offers a vast range of use in:

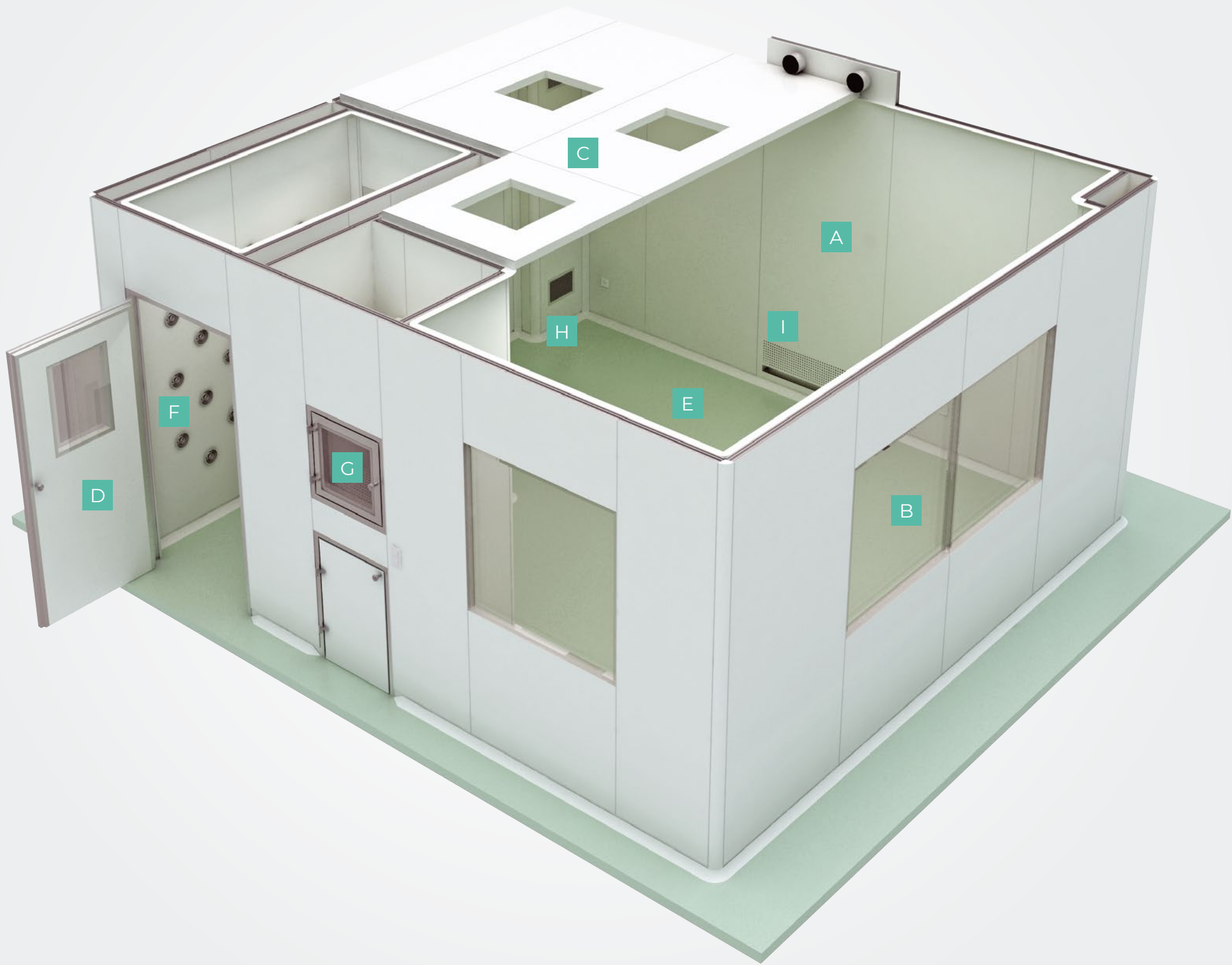
Pharmaceutical industry,  
Micro-electronics,  
Chemical industry,  
Food industry,  
Health facilities,  
Laboratories etc.

A team of young experts that is responsible for cleanrooms development consists of a group of people that participated in international competitions throughout Europe and Asia, and with their experience, hard work and devotion they are responsible for the great satisfaction of our partners.

Through the pursuit of modernization and contemporaneous business, the entire production and design system is based on automation and BiM design.



# CLEANROOM OVERVIEW



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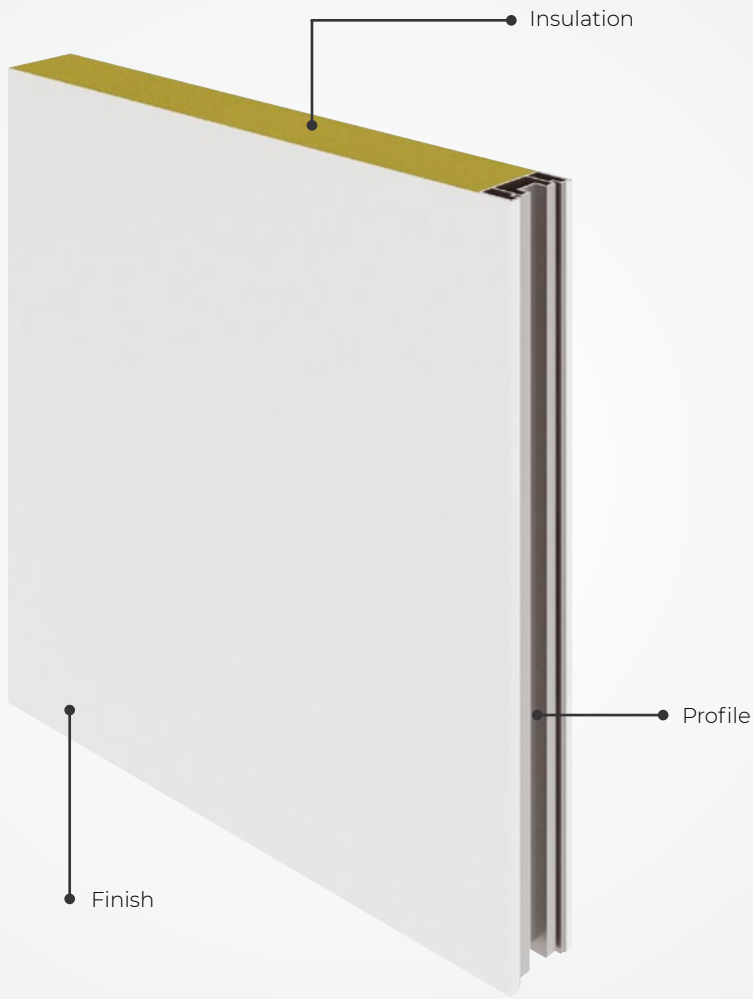
# WALL SYSTEM

Tervoent Cleanrooms are designed to satisfy all GMP and FDA requirements.

Modular design of Tervoent Cleanroom Wall panels allows for their simple integration with other systems, such as: doors, windows, electrical installation, mechanical installation, plumbing installation, etc. Cleanroom Cladding is the solution which could optimize usable cleanroom space, and provide a positive financial impact to projects in spaces with an existing wall structure.

Tailor-made solutions ensure high impermeability levels, and application within highly regulated environments.

Finishing of the cladding is the same as of the cleanroom walls and can be perfectly connected to other Tervoent cleanroom systems.



## WALL TECHNICAL DATA

| WALL PANEL                |   |
|---------------------------|---|
| COMPONENT                 | CHARACTERISTICS   |
| Wall Frame                | Aluminum profile  |
| Insulation*               | Rock wool 100 kg/m3                                     |
| Finishing Layer*          | Galvanized sheet; Aluminum sheet; Stainless steel sheet |
| Color*                    | RAL 9016 – 110µm  |
| Modular Dimensions Max    | 62 x 1200 x 3100 mm                                     |
| OPTIONAL                  | CHARACTERISTICS   |
| Pre-fabricated Cut-out    | Aluminum profile d=2mm, w/l=60/26 mm                    |
| Reinforcement             | Aluminum d=10mm   |
| In-Wall Electrical Chanel | Aluminum profile d=2mm, w/l=60/80 mm                    |

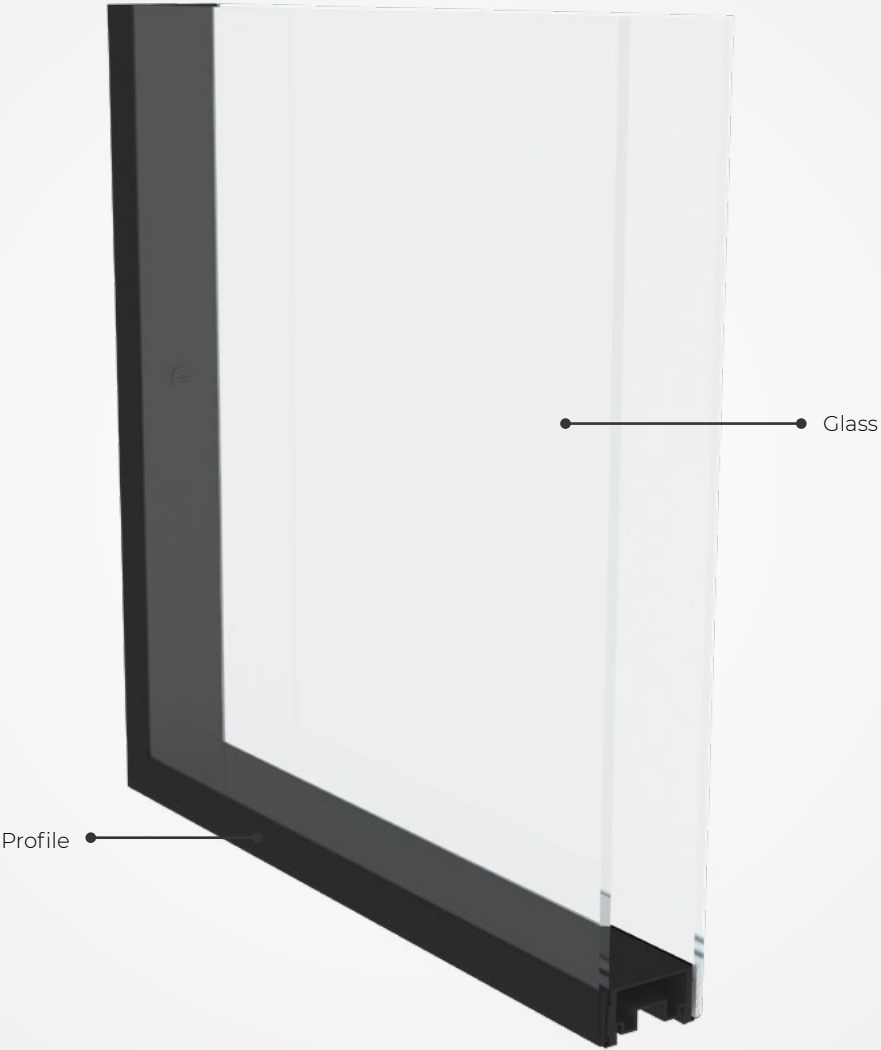
\* Additional options possible on user request



# GLAZING

Termovent Cleanroom Glazing System is a modular glassing system with high quality tempered glass, designed to be flush on both sides of wall surfaces. It is fully

compatible with all other modular Cleanroom Systems. Glass partitions are available in a clear design or in different patterns.



## GLAZING TECHNICAL DATA

| GLAZING                |                     |
|------------------------|---------------------|
| COMPONENT              | CHARACTERISTICS     |
| Window Frame           | Aluminum profile    |
| Insulation             | Silica gel          |
| Finishing Layer*       | TVG Glass           |
| Color*                 | Clear               |
| Modular Dimensions Max | 62 x 1200 x 3100 mm |

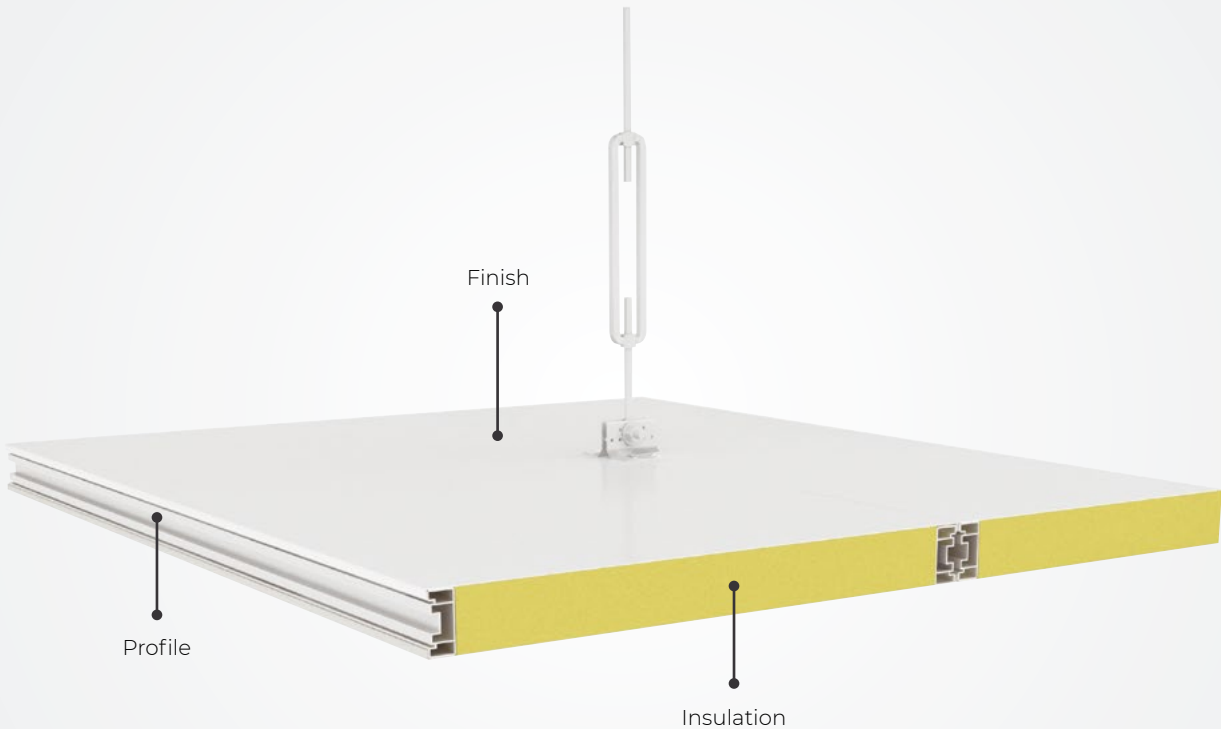
\* Additional options possible on user request



# CEILING

Termovent Ceiling System is prefabricated with all necessary openings for technology integration, and is easily reassembled if needed. Several options of different ceiling types can be used, depending on application, load requirements, cleanroom environment, etc.

Main components of this system include sandwich panels with rounded edges, which simplifies their cleaning and maintenance processes. Upon the installation, particle infiltration into cleanrooms is completely prevented.



## CEILING TECHNICAL DATA

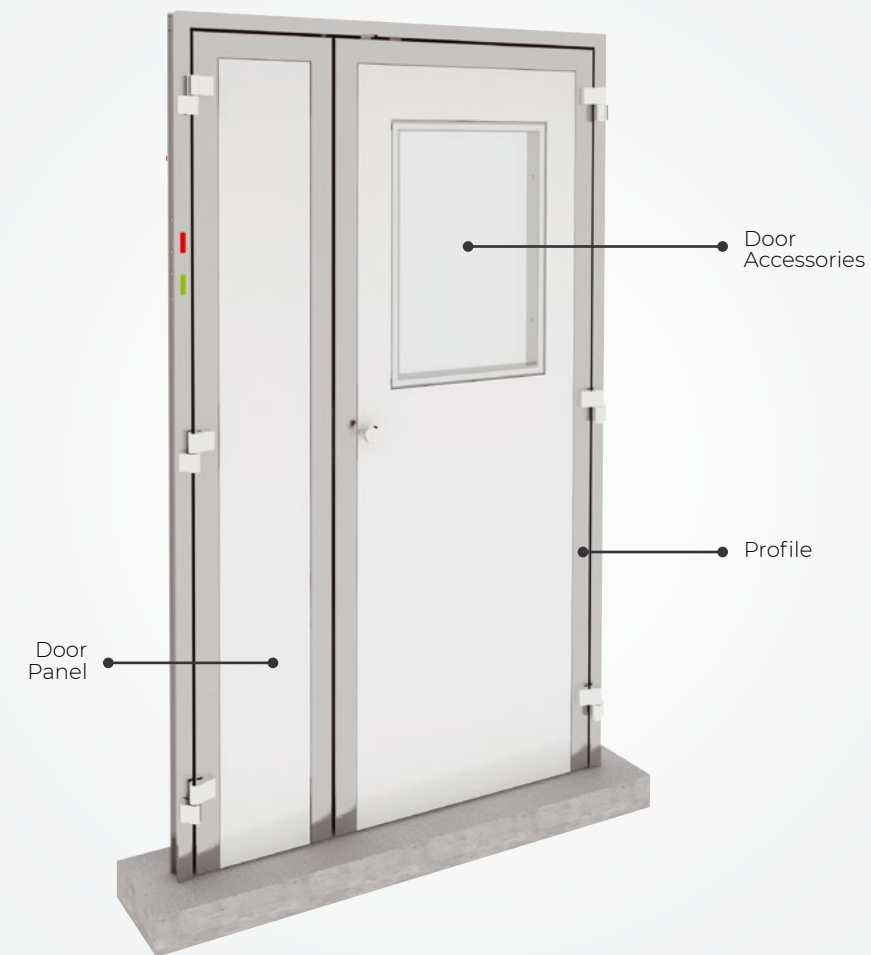
| CEILING PANEL          |   |
|------------------------|---|
| COMPONENT              | CHARACTERISTICS   |
| Wall Frame             | Aluminum profile  |
| Insulation*            | Rock wool 100 kg/m3                                     |
| Finishing Layer*       | Galvanized sheet; Aluminum sheet; Stainless steel sheet |
| Color*                 | RAL 9016 – 110µm  |
| Modular Dimensions Max | 62 x 1200 x 3100 mm                                     |
| OPTIONAL               |   |
| Pre-fabricated Cut-out | Aluminum profile d=2mm, w/l=60/26 mm                    |

\* Additional options possible on user request

# DOOR

Termovent Cleanroom Door System prevents air-leaks, which is achieved with permanent concealed magnets.

All door parts are designed to be flush to and perfectly integrated with all cleanroom elements. Termovent Doors comply with ISO and GMP regulations.



## DOOR TECHNICAL DATA

| DOOR                 |   |
|----------------------|---|
| COMPONENT            | CHARACTERISTICS   |
| Door External Frame  | Anodized or powder coated aluminum profile              |
| Door Wing Frame      | Anodized or powder coated aluminum profile              |
| Insulation           | Rock wool 100 kg/m3                                     |
| Finishing Layer      | Galvanized sheet; Aluminum sheet; Stainless steel sheet |
| Color*               | Wing - RAL 9016 – 110µm; Frame - RAL 9006 – 50µm        |
| Single door Max Dim. | 62 x 1200 x 3200 mm                                     |
| Double door Max Dim. | 62 x 2500 x 3200 mm                                     |

\* Additional options possible on user request

### DOOR ACCESSORIES LIST

Window

Door Bottom Seals

Push plate

Kick plate

Door Handle

Emergency push bar

Reed relay

Lock with key

Door Closers

Interlock Equipment

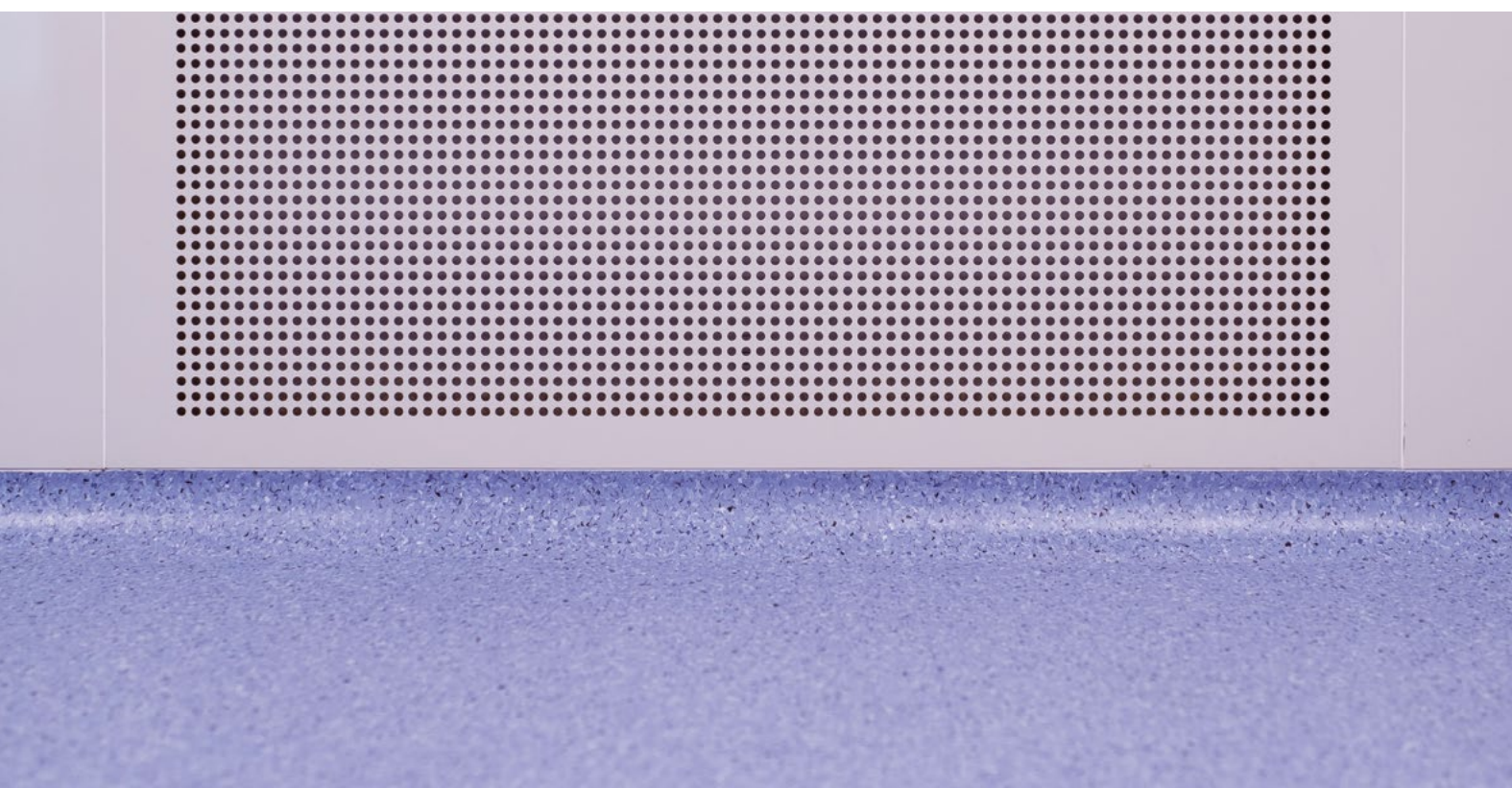
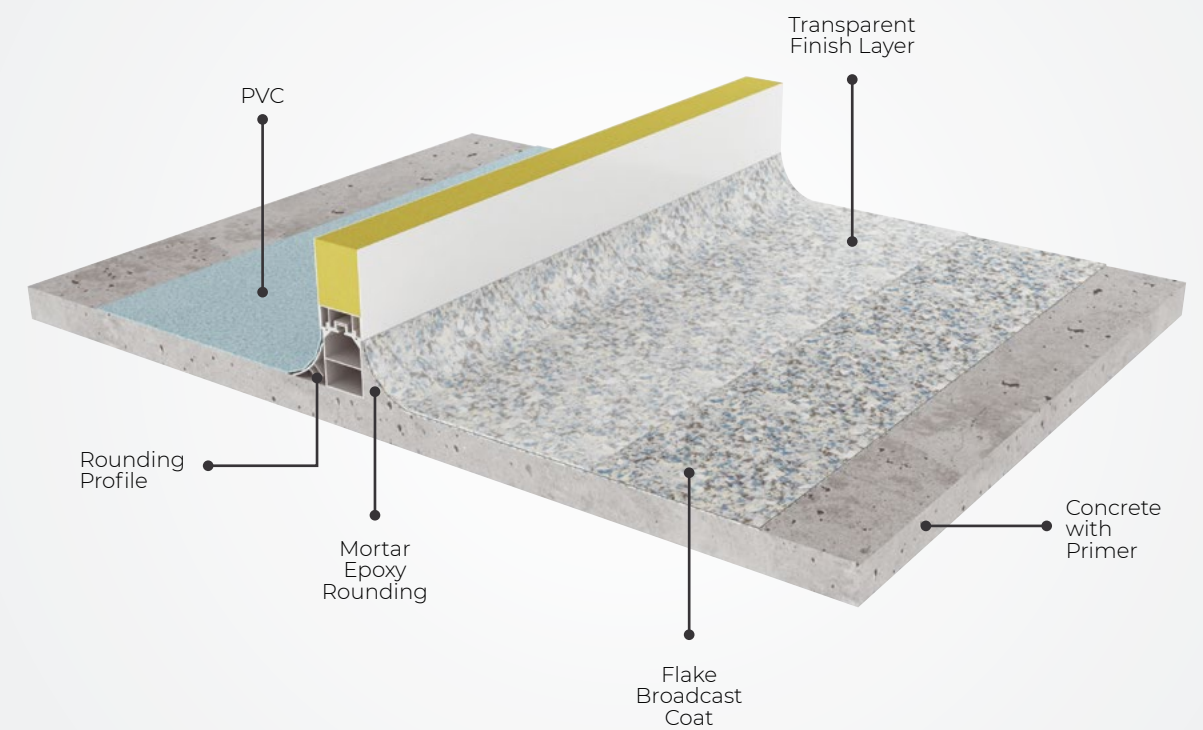


# FLOOR



Termovent provides the best floor application options possible. We focus on delivering the best technical solution in terms of traffic

load function, processes and GMP requirement fulfilment in the cleanroom area.



## FLOOR TECHNICAL DATA

| FLOOR         |  |
|---------------|--|
| COMPONENT     | CHARACTERISTICS  |
| Type          | EP, VE, PVC  |
| Hygienic      | Yes  |
| Easy cleaning | No sharp edges – prefabricated rounded profiles and elements |

\* Additional options possible on user request





# ACCESSORIES

Termovent applies the latest knowhow in the design and production of various Cleanroom accessories - elevating the Cleanroom to its full potential.

All solutions are custom made, to fit all user requirements.

AIR SHOWER

PASS BOX

PROTECTION

GRIDS

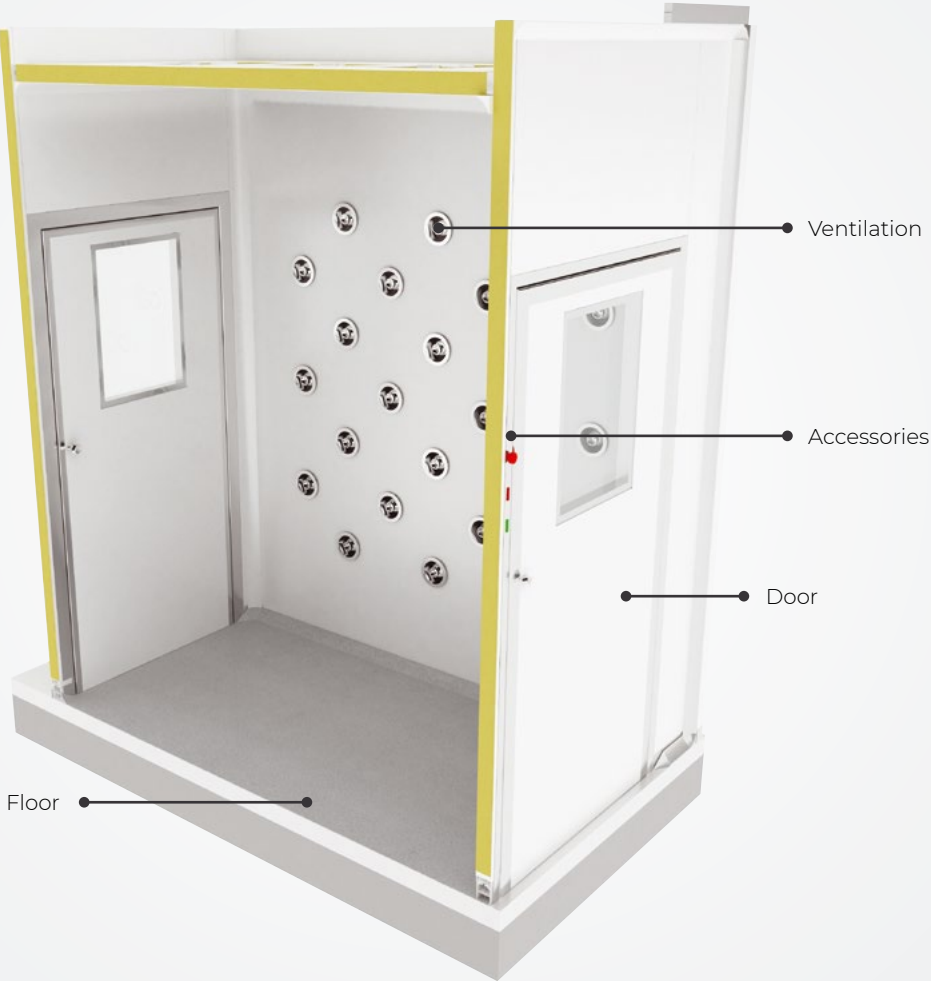
LAF

FFU

# AIR SHOWER

Termovent Air Shower design ensures a high level of control of transfer between two different areas.

The Air Shower is fully automated and user friendly. Design is adjustable in terms of personnel capacity and Cleanroom level.



## AIR SHOWER TECHNICAL DATA

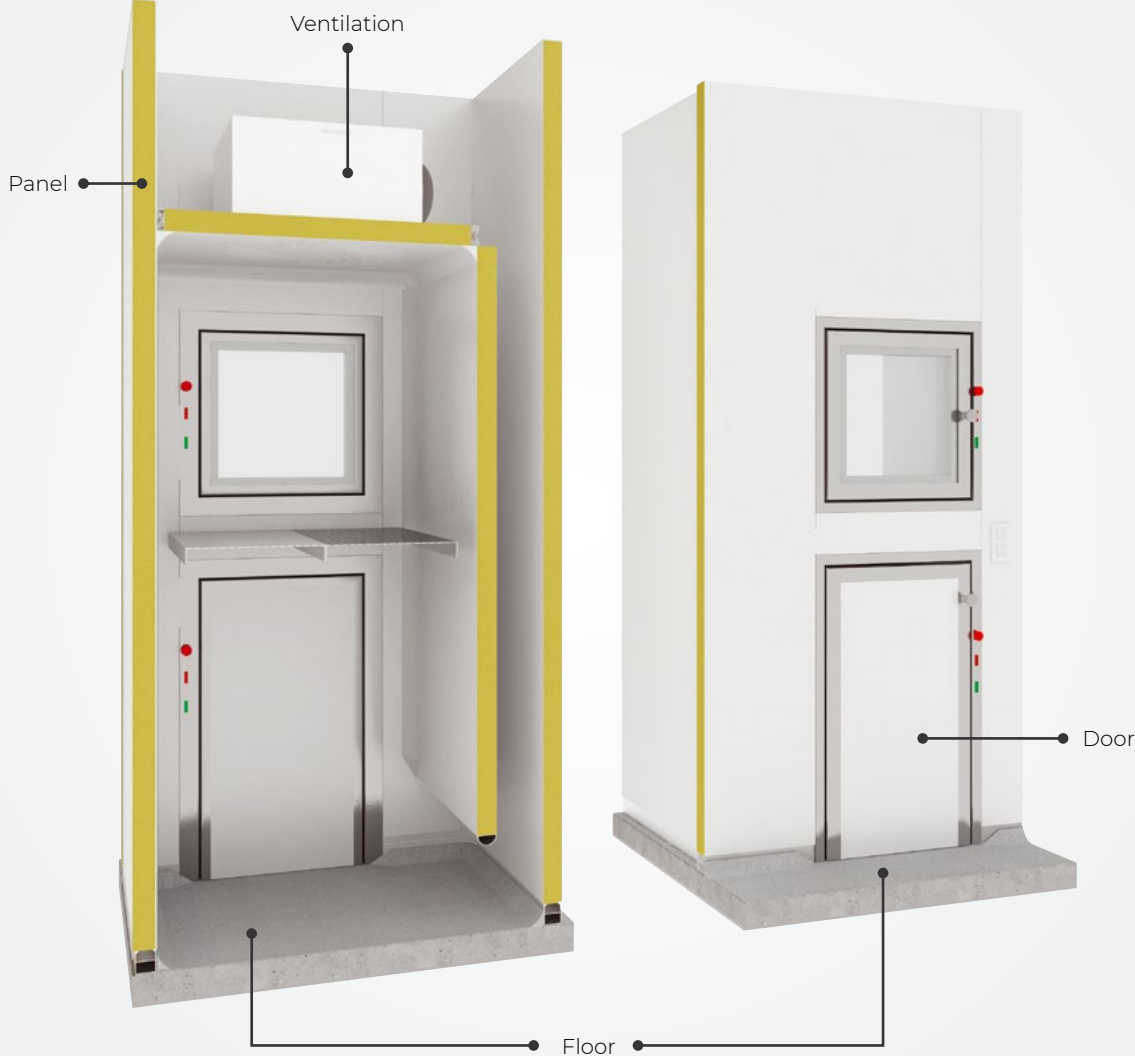
| Position       | Component                   |
|----------------|-----------------------------|
| Wall / Ceiling | Cleanroom Panel TERMOVENT   |
|                | Touch Panel                 |
|                | Nozzles                     |
|                | Cleanroom Light Fixture     |
| Door System    | Revision Hatch              |
|                | Door                        |
|                | Window                      |
|                | Door Equipment              |
| Floor          | Interlock System            |
|                | Epoxy or PVC                |
| Ventilation    | HEPA 13 or F9               |
|                | TERMOVENT AHU Unit          |
|                | Wall grid                   |
| Accessories    | UV Light                    |
|                | Pressure & Presence Sensors |
|                | Touch Screen                |
|                | Automatic Door              |





# PASS BOX

Termovent designs various types of pass boxes to fit all customer requests in terms of material transfer. Pass boxes are modular and can be easily moved and reintegrated in different positions in one factory lifetime. Termovent pass boxes maintain contamination conditions at the lowest point.



## PASS BOX TECHNICAL DATA

| Position       | Component                     |
|----------------|-------------------------------|
| Wall / Ceiling | Cleanroom Panel TERMOVENT     |
|                | Cleanroom Light Fixture       |
| Door System    | Door                          |
|                | Window                        |
|                | Door Equipment                |
|                | Interlock System              |
| Floor          | Epoxy, PVC or Perforated Inox |
| Ventilation    | HEPA 13                       |
|                | Wall grid                     |
| Accessories    | UV Light                      |
|                | Pressure & Presence Sensors   |
|                | Touch Screen                  |
|                | Automatic Door                |





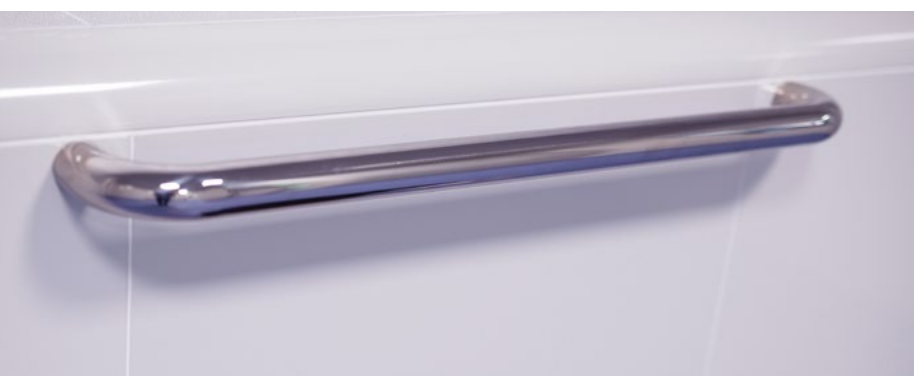
# PROTECTION



Termovent designs wall and door protection to ensure durability and aesthetical view of cleanroom area.

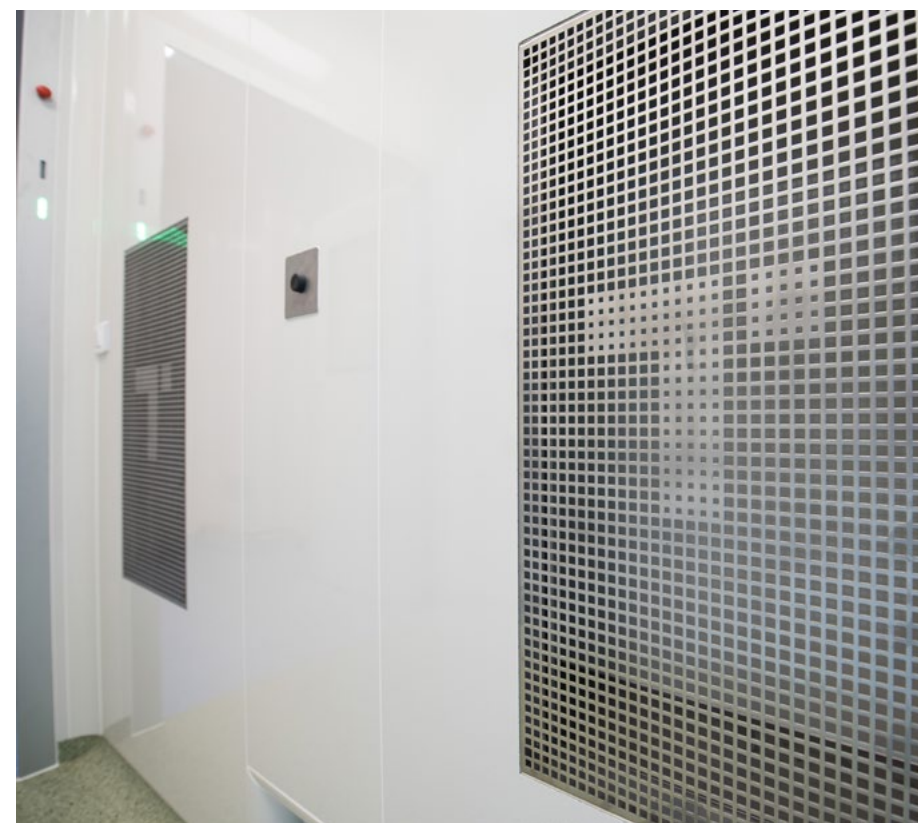
# GRIDS

Ventilation grids are part of the standard equipment used in Cleanrooms. Termovent designs different types and patterns of grids, to meet the expectations of the most demanding customers.



## PROTECTION TECHNICAL DATA

| PROTECTION  |                               |
|-------------|-------------------------------|
| COMPONENT   | MATERIAL                      |
| Wall based  | HPL; AISI 304/316; PP Plastic |
| Floor based | AISI 304/316                  |



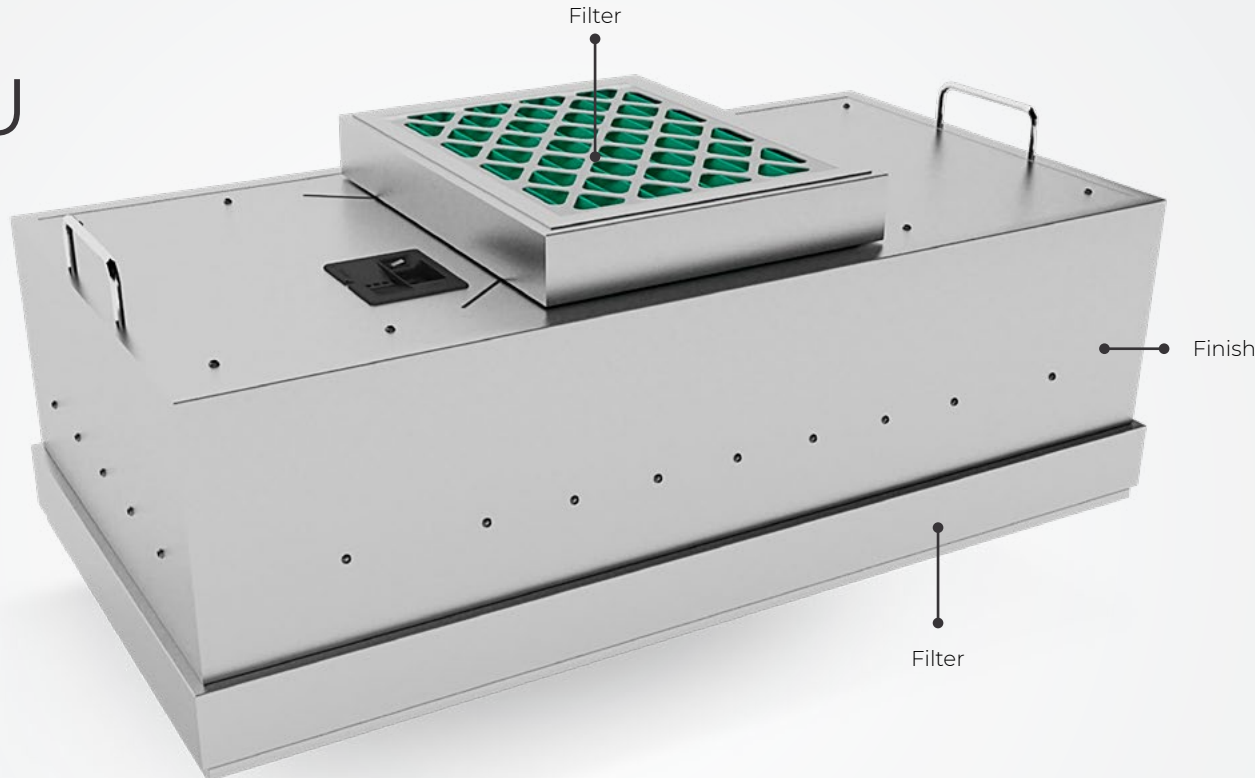




LAF

Termovent designs and produces tailor-made solutions for LAF units.

FFU



Termovent Fan Filter Units (FFU) for Cleanroom environments are used in various healthcare, pharmaceutical, microelectronics and laboratory applications.

These reliable units, designed to provide a uniform micro-filtered air flow, meet air cleanliness standards and deliver high volumes of unidirectional HEPA filtered air, at low noise and high energy efficiency rates.



### LAF TECHNICAL DATA

| Position    | Component                         |
|-------------|-----------------------------------|
| Ventilation | H13 to U15                        |
|             | Ventilation speed $\leq 0,45$ m/s |
| Door System | Door                              |
|             | Window                            |
|             | Door Equipment                    |
|             | Interlock System                  |
| Floor       | Epoxy, PVC                        |
| Control     | CFR 21 / 11                       |
|             | ISO 8 - ISO 5                     |
| Accessories | UV Light                          |
|             | Pressure & Presence Sensors       |
|             | Touch Screen                      |

### FFU TECHNICAL DATA

| TKFFU Technical Data   |   | 1200x600 | 1200x1200 |
|------------------------|---|----------|-----------|
| Length                 | [mm]  | 1225     | 1225      |
| Width                  | [mm]  | 625      | 1225      |
| Height                 | [mm]  | 450      | 450       |
| Unit Casing Standard   | Powder coated aluminum sheet  |          |           |
| Unit Casing Optional   | Powder coated galvanized steel<br>304 stainless steel   |          |           |
| Installation side      | Top/Plenum (standard)   |          |           |
| Filter inspection side |   |          |           |
| Controller options     | Continuously variable speed via MODBUS with corresponding connection box;<br>Filter clogging $\Delta P$ sensor;<br>Constant air flow; |          |           |



GRAND MEDICA | Novokuznetsk, Russia



EVALAR | Biysk, Russia



KATOD NV | Novosibirsk, Russia



YURA CORPORATION | Leskovac, Serbia





PAUL HARTMANN | Domodedovo, Russia



FIRE EYE | Belgrade, Serbia



REFERENCE LIST

- **KATOD NV**, Novosibirsk, Russia, Microelectronics production
- **PHARMASYNTEZ**, Irkutsk, Russia, Pharmaceutical production
- **GRAND MEDICA**, Novokuznetsk, Russia, Hospital
- **PHARMASYNTEZ NORD**, St. Petersburg, Russia, Pharmaceutical production
- **BRATSKCHEMSYNTEZ**, Bratsk, Russia, Pharmaceutical production
- **YURA CORPORATION**, Leskovac , Serbia, Electronic board production
- **ALTAY VITAMIN**, Biysk, Russia, Pharmaceutical production
- **KOTEKS VISCOFAN**, Novi Sad, Serbia, Food production
- **NIKA PHARM**, Novosibirsk, Russia, Pharmaceutical production
- **EVALAR**, Biysk, Russia, Pharmaceutical production
- **COVID LABORATORY FIRE EYE**, Belgrade, Serbia, Laboratory
- **COVID HOSPITAL BATAJNICA**, Belgrade, Serbia, Hospital
- **COVID HOSPITAL KRUSEVAC**, Krusevac , Serbia, Hospital
- **JOCKEY , Nova Pazova**, Serbia, Manufacturing
- **ASPECTUS PHARMA**, Skopje, North Macedonia, Pharmaceutical production
- **WEST PHARMASUTICALS**, Kovin, Serbia, Pharmaceutical production
- **NOVARE S, Zrenjanin**, Serbia, Manufacturing
- **PAUL HARTMANN**, Domodedovo, Russia, Pharmaceutical production



# QUALITY MANAGEMENT SYSTEM

## CERTIFICATES AS THE GUARANTEE OF QUALITY

Termovent is fully committed to meeting the customer's requirements in terms of quality, environmental protection and safety. The set high quality standards are the cornerstone of our operations.

In order to achieve the goals we set at all times, our employees are involved in the processes of continuous improvement and optimization of our products and services. The success of this approach is confirmed by numerous certificates held by Termovent, which guarantee the highest standards to our customers.



### Eurovent Certita Certification

Eurovent Certita Certification has certified that Termovent Air Handling Units, Range KK, and Software for calculation of performances SELECT:pro, Trade name TERMOVENT, have been assessed according to requirements of the following standard: OM-5-2017



### CE marking for Termovent AHUs

Termovent Air handling Units hold CE Marking of Conformity to Machinery Directive 2006/42/EC Annex II, Point A. In addition, Termovent AHUs are designed and produced according to set of harmonized standards: EN ISO 12100:2010, EN ISO 12100:2010, EN ISO 13850:2015, EN 1037:1995+ A1:2008, EN ISO 14120:2015, EN 60204-1:2006/A1:2009 and EN 61000-6-2:2005/AC:2005



### ISO 13485:2016

Certification body SIQ confirmed that Termovent introduced Quality Management System in accordance with ISO 13485:2016 in the field of manufacturing, design and installation of Termovent panels for the construction of clean rooms.



### ISO 9001: 2015

Certification body TÜV SÜD Management Service GmbH confirmed that Termovent has established and applies a Quality Management System for design, sales, manufacturing, assembly and installation of HVAC systems and Cleanrooms.



### ISO 14001:2015

Certification body TÜV SÜD Management Service GmbH confirmed that Termovent has established and applies a Environmental Management System for design, sales, manufacturing, assembly and installation of HVAC systems and Cleanrooms.



### ISO 45001:2018

Certification body TÜV SÜD Management Service GmbH confirmed that Termovent has established and applies an Occupational Health and Safety Management System for design, sales, manufacturing, assembly and installation of HVAC systems and Cleanrooms.



### AAA Creditworthiness Rating

Bisnode Serbia awards Golden certificate of Creditworthiness Rating







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